

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of  
Shigeo Kittaka et al.

Serial No.: (not assigned) Group Art Unit:  
Filed: Feb. 14, 2002 Examiner:

For: Optical Coupling System and Optical Device  
Using Same

Box: New Appln.  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

## PRELIMINARY AMENDMENT

Sir:

Prior to computation of the filing fee for the concurrently filed application identified above, please amend the application as follows:

In the claims:

Please substitute the following claims 4. 5.6 and 8-12 for the like-numbered claims in the concurrently filed application. A clean copy of these claims is attached as an appendix to this amendment.

5. An optical coupling system according to claim 2 [or 4], wherein said total coupling loss is not larger than 0.05 dB.

6. An optical coupling system according to Claim 1 [or 3], wherein said light source and said light-receiving unit are constituted by end surfaces of optical fibers which are equal in mode field diameter to each other.

8. An optical coupling system according to claim 1 [or 3], wherein said lens having a positive refractive power is a rod lens having a gradient index distribution in a direction of a radius thereof.

9. An optical coupling system according to claim 1 [or 3], wherein said lens having a positive refractive power is a plano-convex lens having a gradient index distribution in a direction of an optical axis thereof.

10. An optical coupling system according to claim 1 [or 3], wherein said lens having a positive refractive power is a plano-convex lens made of a homogeneous material.

11. An optical coupling system according to claim 1 [or 3], wherein said lens having a positive refractive power is a sphere lens made of a homogeneous material.

12. An optical coupling system according to claim 1 [or 3], wherein said lens having a positive refractive power has a grating lens surface.

#### REMARKS

This Preliminary Amendment has been made to eliminate multiple dependencies in claims 5, 6, 8, 9, 10, 11 and 12. Claims 1-17 remain active in the application. Early and favorable consideration is respectfully requested.

Respectfully submitted,



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APPENDIX

5. An optical coupling system according to claim 2, wherein said total coupling loss is not larger than 0.05 dB.

6. An optical coupling system according to Claim 1, wherein said light source and said light-receiving unit are constituted by end surfaces of optical fibers which are equal in mode field diameter to each other.

8. An optical coupling system according to claim 1, wherein said lens having a positive refractive power is a rod lens having a gradient index distribution in a direction of a radius thereof.

9. An optical coupling system according to claim 1, wherein said lens having a positive refractive power is a plano-convex lens having a gradient index distribution in a direction of an optical axis thereof.

10. An optical coupling system according to claim 1, wherein said lens having a positive refractive power is a plano-convex lens made of a homogeneous material.

11. An optical coupling system according to claim 1, wherein said lens having a positive refractive power is a sphere lens made of a homogeneous material.

12. An optical coupling system according to claim 1, wherein said lens having a positive refractive power has a grating lens surface.